

REMARKS

Claims 1-8 are pending in the application.

Rejection Under 35 U.S.C. § 102(b)

Claims 1-4 stand rejected under 35 U.S.C. § 102(b) as allegedly being anticipated by U.S. Patent No. 5,229,252 to Flynn et al. (hereinafter "Flynn").

The present invention is directed to a "dual cure" process for coating a substrate by:

(1) applying to the substrate a coating composition consisting essentially of:

- A) at least one compound which contains at least two (meth)acrylate groups and at least one isocyanate-reactive group and which is free from isocyanate groups and blocked isocyanate groups,
- B) at least one blocked polyisocyanate, which does not contain any ethylenically unsaturated groups,
- C) at least one photoinitiator, and
- D) optionally one or more components selected from the group consisting of UV absorbers, catalysts, deaerating agents, coupling agents, flow control agents, solvents dyes and pigments, and

(2) curing the coating composition by the action of UV light, which causes a solvent resistant surface to form on the coating, and (3) post-curing by increasing the temperature of the coating.

Flynn discloses a photoimageable composition for forming a solder mask that requires a "triple cure" process. The solder mask includes (1) a photopolymerizable acrylate chemical system which renders exposed portions insoluble to alkaline aqueous developers and (2) an epoxy chemical system which hardens the composition after exposure and development. The acrylate chemical system includes acrylate monomers, epoxy-acrylate oligomers and a photoinitiator. The epoxy chemical system includes an epoxy resin and a curative therefore. The composition further includes a cross-linking agent which is reactive with hydroxyl groups of the acrylate and epoxy chemical systems.

As the Examiner points out, Flynn must include components (a) through (e):

- (a) acrylic monomers,
- (b) photoinitiator(s),
- (c) epoxy-acrylate oligomers,
- (d) epoxy resins,
- (e) an acidic catalyst, and

optionally (f) a cross-linking agent (col. 1, line 64 to col. 2, line 3).

As amended, the present claims do not allow for the inclusion of (d) epoxy resins, which are required in the photoimageable composition disclosed by Flynn.

The Examiner indicates that "When the PTO shows a sound basis for believing that the products of the applicant and the prior art are the same, the applicant has the burden of showing that they are not." Applicants submit that they have met this burden and that the Examiner has not given the Amendment dated November 19, 2003 and indicated for consideration in the Request for Continued Examination dated December 23, 2003 proper consideration and weight.

The above referenced amendment used the restrictive claim language "consisting essentially of" in the preamble describing components A through D in the coating composition of the claimed method. "The transitional phrase 'consisting essentially of' limits the scope of a claim to the specific materials or steps 'and those that do not materially affect the basic and novel characteristic(s)' of the claimed invention." MPEP 2111.03 citing In re Herz, 537 F.2d 549, 551-52, 190 USPQ 461, 463 (CCPA 1976).

Flynn requires epoxy resins at a level of from 20 to 80 percent in order to impart hardness and durability to the cured film. Thus, according to the disclosure of Flynn, the epoxy resin materially affects the basic and novel characteristics of the claimed photoimageable composition.

The Examiner suggests that Flynn include diacrylate esters of bisphenol A as an epoxy resin, allegedly meaning that epoxy acrylates are epoxy resins. This suggestion is just not correct.

The Examiner suggests that Flynn include diacrylate esters of bisphenol A as an epoxy resin, citing Example 1 of Flynn, which includes such a resin (as the epoxy-acrylate oligomer (c)) as well as HETRON 912, an epoxy functional

methacrylate resin available from Ashland Specialty Chemical Company, Dublin, Ohio as the epoxy resin (d). The Examiner seems to have overlooked the fact that in Flynn, the preferred epoxy-acrylate oligomers in (c) are "diacrylate (or methacrylate) esters of bisphenol A type resins. One skilled in the art would not misconstrue a preferred hydroxyl functional epoxy-acrylate oligomer (c) for the required epoxy functional resin (d) as disclosed in Flynn. The coating composition used in the claimed invention does not include the required epoxy resin (d) as disclosed in Flynn which is included in all of the formulation examples (Examples 1, 2, and 5) of Flynn.

The following excerpt from Flynn is instructive:

Because substantially all of the epoxy groups are reacted with acrylic acid moieties, the epoxy-acrylate oligomer functions primarily as an acrylate, the acrylate moieties of the oligomer polymerizing along with the acrylic monomers during the photoinitiated reaction which renders exposed portions of the photoimageable composition layer insoluble to aqueous alkaline solution. The substantial hydroxyl functionality provides the basis for cross-linking with the cross-linking agent (f), if such a cross-linking agent (f) is used. (col. 3, lines 11-20).

Thus, the distinction between the present invention and that of Flynn is confirmed within the Flynn patent itself.

In the present invention, Applicants sought to provide polyisocyanate products that contain both ethylenically unsaturated groups and blocked NCO groups as well as a process for coating which, leads to coatings that provide excellent resistance after UV curing and, after additional thermal curing, to optically perfect coatings (page 2, lines 1-6 of the specification). Applicants were able to meet the objective by using the claimed coating composition. Adding additional components and reactants, such as epoxy resins, adversely affects the resistance and/or optical properties of the final cured coating. The coating compositions of the present invention provide defect-free, optically attractive coatings (page 8, lines 27-31 of the specification). Thus the inclusion of epoxy resins to the coating composition in the claimed invention is inappropriate.

As Flynn does not disclose the coating composition free of epoxy resins of the claimed invention, Flynn does not anticipate Claims 1-4. Therefore, the rejection under 35 U.S.C. § 102(b) should be withdrawn.

Rejection Under 35 U.S.C. § 103(b)

Claims 5-8 stand rejected under 35 U.S.C. § 103(a) as being anticipated by Flynn in view of U.S. Patent No. 5,916,979 to Koegler et al. (hereinafter "Koegler"). The Examiner indicates that Koegler teaches the claimed blocking agents.

Koegler discloses an organosol polyester coating material that includes at least one linear and/or branched amorphous polyester in solution, at least one blocked polyisocyanate resin and/or at least one triazine resin. Koegler is not directed to UV-curing in any way. Koegler simply discloses the reaction of blocked NCO-groups with OH-groups, which is of limited relevance to the claimed invention. Using diisopropylamine as a blocking agent is known as is disclosed at page 5, line 14 of the specification.


Koegler does not provide any disclosure to forming a coating layer that is solvent resistant after UV cure and before thermal curing. Further, there is no disclosure in Koegler that would motivate one skilled in the art to remove the epoxy resin, component (d) from the photoimageable composition disclosed by Flynn, which the present claims effectively exclude.

Thus no combination of Koegler and Flynn disclose or in any way suggest the claimed process. As such, the rejection of Claims 5-8 under 35 U.S.C. § 103(a) should be withdrawn.

CONCLUSION

Applicants assert that the amendments have placed the claims in form for allowance. In view of the above amendments and remarks, reconsideration of the rejections and allowance of Claims 1-8 are respectfully requested.

Respectfully submitted,

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